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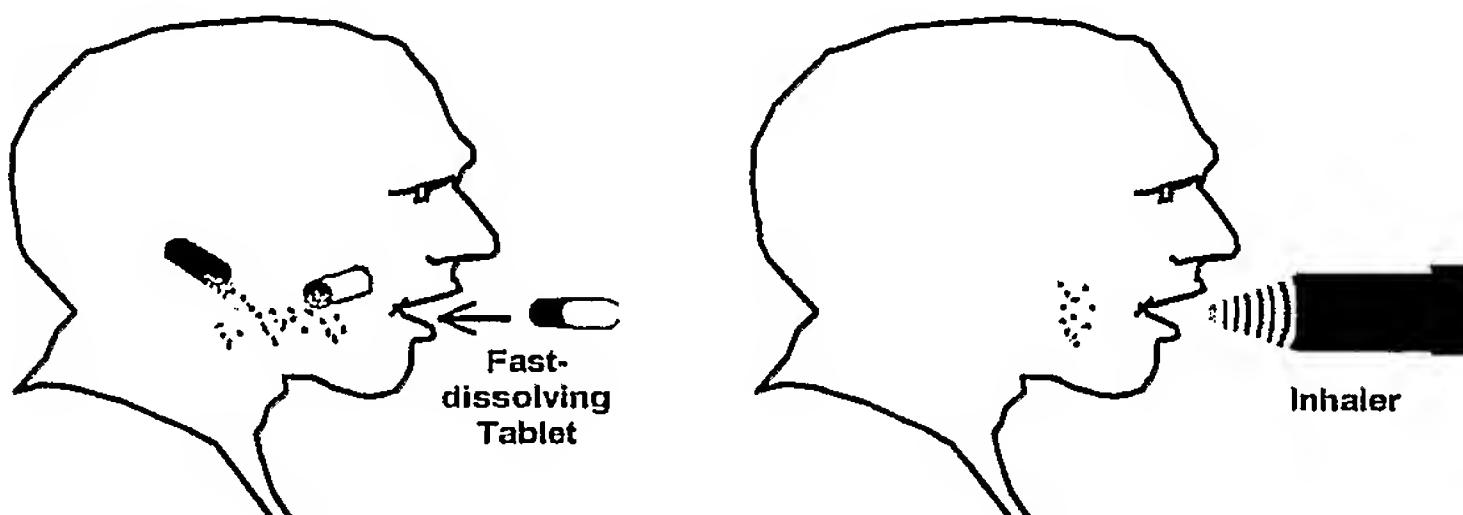
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(54) Title: SYSTEM AND METHOD FOR REAL-TIME DIAGNOSIS, TREATMENT, AND THERAPEUTIC DRUG MONITORING

**Patient Compliance Monitoring System**  
Step 1 - Medication is taken, releasing Marker Compound



**Marker compound is released by dosage form for detection**

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(57) **Abstract:** Systems and methods for diagnosing and/or treating diseases as well as monitoring disease treatment. For diagnosis, the present invention uses nanoparticle-based assemblies, which comprise a nanoparticle; a surrogate marker; and a means for detecting a specific chemical entity. In certain embodiments, nanoparticle-based assemblies include a payload for simultaneous diagnosis and treatment of disease. In further embodiments, a therapeutic drug and therapeutic drug marker are administered to a patient to monitor disease treatment. Bodily fluid samples are analyzed using sensor technology to detect the presence of surrogate and/or therapeutic drug markers to provide an efficient and accurate means for diagnosing a disease and/or monitoring disease treatment.



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